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Impact of Foreign Direct Investment on the Economy of Nigeria

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Abstract
The study investigated the impact of foreign direct investment on economic growth in Nigeria using annual time series data from 1981 to 2013. The study also examined the effects of exchange rate of the naira and openness of the economy on economic growth in Nigeria. The ordinary least square technique and vector error correction model was employed in estimating the long run effects and the parsimonious short run dynamics of the parameter estimates. The results of the study revealed that in both the long run and short run, foreign direct investment has positive and significant impact on gross domestic product in Nigeria. The result also revealed that exchange rate of the naira has negative effect on economic growth in Nigeria while trade openness had no impact on economic growth in Nigeria. This study recommends policies that will encourage foreign direct investment in non-oil sector such as agriculture, mining and industrial sectors to boost economic activities and increase output level in Nigeria. It also recommends the removal of government induced distortions and provision of conducive environment for foreign investors to operate and the creation of friendly business environment in the country by the government to increase the level of openness.
Keywords: Economic Growth, Foreign Direct Investment, Exchange Rate, Trade Openness, Domestic Inflation

1. Introduction

In recent years, several emerging market economies and developing countries around the world have begun to receive substantial flows of foreign capital. These flows are notable because of their magnitude and because they represent a break from the period of the debt crisis for many of the recipient countries. The trends of the foreign direct investment in recent times whether public or private is positively related to democratization and stable economic climate existing in the recipient developing countries (Egwuatu, 2007). This implies that the more, less developed countries are favorably disposed to democracy, good governance and stable economic policies, the more foreign direct investment they can attract.

The growing integration of production, trade and capital transfers into the global economy and the success story of the Asian tigers compelled African countries to embark on major policy, structural and institutional reforms in addition to embracing democratic government with a view not only to curtail the tide of economic decline and fluctuations, but also to launch the continent on the path to sustainable economic growth and development. In the post independence years, many African countries, Nigeria inclusive, regardless of ideological orientation, had embarked on massive medium to long term plans in which public enterprises in all sectors were to serve as engines of growth and instrument for achieving sustainable economic independence. African governments were realistic and able to recognize the important role the private sector plays, mostly foreign direct investment in economic growth and development of a nation. The increase in foreign capital inflows offers opportunities for Nigeria and other developing countries to invest in infrastructure and facilitate trade finance to foster a self-reinforcing cycle of sustained economic growth and poverty reduction (Udeajah, 20011). It becomes imperative for Nigeria to seek to tap from foreign capital to meet her investment demands and foster economic growth by establishing transparent rules and procedures with the assurance that contracts will not be breached, domestic capital market strengthened, public-private risk mitigating instruments developed and public providers of infrastructural services assisted to attract foreign investors into the country.

Sub – Saharan Africa as a region now has to depend very much on foreign direct investment for so many reasons, some of which have been highlighted by (Asiedu, 2012). It should be noted that rapid growth requires high level of investment, which in the absence of foreign direct investment must derive from high savings rates. Although rapid gross national product gains are possible through such ‘’inward’’ looking policies, they are historically rare in Nigeria. This can be attributed to low saving culture and poverty. The choice for

improving the Nigerian investment climate emanates from its acknowledged advantages (Akinlo, 2004). In fact, the New Partnership for African Development (NEPAD), a programme floated by Africa's statesmen to address the downward spiral of poverty and set Africa on the road to globalization and economic integration was launched to increase available capital in the sub region to US$64 billion through a combination of reforms, resource mobilization and enabling environment for investment (Funke and Nsouli, 2003).

It is the desire to attract investment, particularly foreign direct investment that has informed many economic reforms in Nigeria. The economic rationale for offering special incentives to attract foreign direct investment frequently derives from the belief that it promotes growth not only directly by augmenting capital formation in the recipient countries, but also indirectly by improving human capital development, helping technology transfers and strengthening competition (Qi, 2007). The area in the economics of development that have aroused so much controversy which is subject to varying interpretations is the issues of the benefits and costs of foreign direct investment. This argument is not so much about the influence of multinational corporations and traditional economic aggregates such as gross domestic product, investment and savings but on the fundamental economic and social meaning of development as it relates to the diverse activities of multinational corporations, that is the nature, style and character of desirable economic growth process. This study is therefore carried out to examine the impact of foreign direct investment on economic growth in Nigeria. *The working hypothesis for this study is that foreign direct investment has no positive and significant effect on economic growth in Nigeria.* By the time the study is concluded, discoveries will either confirm or dispute this proposition.

This paper for the purposes of clarity and logical presentation is structured into five sections as follows: Introduction; Review of related literature; methodology; data analysis and results and conclusion.

2. Review of Related Literature

Conceptual Framework

Foreign direct investment is an investment made to acquire a lasting management interest, (normally 10% of voting stock) in a business enterprise operating in a country other than that of the investor, defined according to residency (World Bank, 1996). Such investments may take two forms, either "Greenfield" investment (also called "mortar and brick" investment) or mergers and acquisitions, which entail the acquisition of existing interest rather than new investment. In corporate governance, ownership of at least 10% of the ordinary shares or voting stock is the criterion for the existence of a direct investment relationship. Ownership of less than 10% is recorded as portfolio investment (Macaulay, 2007).

Foreign direct investment is therefore a measure of foreign ownership of productive assets, such as factories, mines and land. Increasing foreign investment can be used as one measure of growing economic integration and globalization (Gnansonuou, 2008).

In the past ten years, the classic definition of foreign direct investment as noted above has changed considerably. This notion of a change in the classic definition, however, must be kept in the proper context. Very clearly, over two third of direct foreign investment is still made in the form of fixtures, machinery, equipment and buildings. Moreover, larger multinational corporations and conglomerates still make the overwhelming percentage of foreign direct investment. But, with the advent of the internet, the increasing role of technology, loosening of direct investment restrictions in many markets and decreasing communication costs means that newer, non-traditional forms of investment are playing important role in the direction of foreign direct investment and this will into the future. Many governments, both in industrialized and developing nations, pay very close attention to foreign direct investment because they believe that investment flows into and out of their economies may have a significant impact on growth (Asiedu, 2009). However, there has been a dramatic increase in the number of technology start-ups and this**,** together with the rise in prominence of internet usage, has fostered increasing changes in foreign investment patterns. Many of these high tech start-ups are very small companies that have grown out of research and development projects often affiliated with major universities and with some government sponsorship programmes. Unlike traditional manufacturers, many of these companies do not require huge manufacturing plants and immense warehouses to store inventory (Asiedu, 2004).

Another factor to consider is the number of companies whose primary product is an intellectual property right such as a software program or a software-based technology or process. Companies such as these can be housed almost anywhere and therefore making a capital investment in them does not require huge outlays for fixtures, machinery and plants. In many cases, large companies still play a dominant role in investment activities in small, high tech oriented companies (Andreas, 2007). However, unlike in the past, these larger companies are not necessarily acquiring smaller companies outright. The chief reason for this is the risk associated with such high tech ventures. In the case of matured industries, the products are well defined. The manufacturer usually wants to get closer to its foreign market or wants to circumvent some trade barriers by making a direct foreign investment through setting up of subsidiary companies in the host country.

Theoretical underpinning

New Growth Theory

New growth theory had incorporated two important points. Firstly, it viewed technological progress as a product of economic activity. Secondly, new growth theory suggested that knowledge and technology were characterized by increasing returns, and these increasing returns drive the growth process (Muogbo and Kayer, 2012). Consequently, growth has been endogenous in new growth theory rather than exogenous as in old growth theory.

Investment in human capital contributed to increasing returns in the production function and the more resources devoted to Research and Development, the faster the rate of innovations and the higher the rate of growth. According to Muogbo and Kayer, (2012), ''the capital accumulation from foreign direct investment is expected to generate non-convex growth by encouraging the incorporation of new inputs and foreign technologies in the production function of the foreign direct investment (FDI) recipient's countries''. In addition, the transfer of advanced technology strengths the host country's existing stock of knowledge through labour, training, skill acquisition, the introduction of alternative management practices and organizational arrangements. As a consequent, foreign direct investment (FDI) increased productivity in the recipient economy, and foreign direct investment (FDI) could be deemed to be a catalyst for domestic investment and technological progress.

The debate about the impact of foreign investment (FDI) in developing countries remained unsettled in literature. This had generated much intense controversy which had divided scholars into two distinct camps, the pro- foreign investment and the critics of foreign investment. Within each of these two groups, there were varied approaches to analyzing the impact of foreign investments as well as the associated policy prescriptions. According to Jenkins (1987) and Odusola, (2003); the Pro- foreign investment viewed foreign investment as a catalyst to industrial transformation and effective marketing management strategy. The operations of foreign investor added new resources such as capital, technology, management and marketing to host countries in a way that stimulated efficiency and effectiveness. Besides, promoting employment activities, foreign direct investment (FDI) also promote income distribution through bidding up for wages and driving down the return to capital. The proponents of this approach believed that national and foreign private-sector enterprises, if permitted to operate in competitive market conditions lead to ingenuity and creativity which offers developing countries the best prospects for speedy national economic growth.

Two broad groups were discernable under the pro- foreign investment approach: traditional and neo – traditional schools of thought. Under the traditional school of thought were the business school and the neo-classical school. The business school strongly believed in the moral and practical virtues of free enterprise system (Lall, 1974). Similarly, the neo-classical school held the view that foreign investment act as efficient allocators of resources with the proviso that the benefit accrues to both home and host countries (Jenkins, 1987). They therefore recommended the removal of government induced distortions and provision of conducive environment for foreign investors to operate. The neo-classical approach comprised the bargaining school and neo-fundamental school. The proponents of the bargaining school (Greico, 1986), posited that the benefits of foreign investors were not automatic. Rather, they suggested that the distribution of gains among the home and host countries depended on negotiations between the foreign firms and the recipient country's government. Thus, the quality of negotiation had helped developing countries learn how to extract greater benefits from multinationals. They thus recommended the encouragement of foreign investors and that the host countries should build the national institutions that enhances the country's share of the associated benefits.

The critics of foreign direct investments, on the other hand, emphasized the risks that foreign investors posed for developing countries. The extent of these threats varied from one school of thought to another. Other critics of foreign direct investment were the global reach and Marxist/neo-imperialist approaches. The global reach approach saw foreign direct investment as one of the strategies of oligopolistic firms and not an approach to enhancing development oriented international capital flows. Thus, their policy prescriptions hinged on regulations of transfer pricing and restrictive business practices. The Marxist viewed foreign direct investment as the clog in the wheel of developing countries' development.

Romer Growth Theory

Robert Solow started growth theory in the 1950s, and it basically broke the macro economy into three drivers: capital, labour and productivity. It did not explain productivity, but did highlight that this factor seemed to be what really mattered.

Romer's model was instigated by the fact that while there was convergence within various economies, such as developed economies, there is no convergence among all of the economies. So, Japan, France, and the US all varied around a single value, but Africa remained mired in poverty, seemingly unaffected by worldwide economic growth. The existing Solow Growth Model could not explain this, except to trivially note that the African economies had lower productivity, a parameter in the Solow Growth Model.

$$Y = F(x(i), k(i), K) \text{----------Equ(1)}$$

Where: Y is the output level and x(i) is the labor of an individual, k(i) a firm's capital (assume that

people were also firms). K= sum (k(i)), reflecting the idea that bigger economies have more knowledge, and thus, greater productivity. F was increasing in all its arguments. The key technical point he made was to assume Y was a concave function of k(i) and x(i), which was necessary for an equilibrium to exist, yet because F was increasing in K, you had increasing returns to scale in aggregate. Thus, a competitive equilibrium existed even with increasing returns to scale, because their individual effect on total output K was insignificant (otherwise, with increasing returns to scale, everyone soon chose infinity to maximize their production/utility).

Most interestingly multiple equilibra were gotten in that if coordinated could benefit everyone to invest a lot, growth would be higher than otherwise. This highlighted the potential for good institutions to induce greater growth, by offering more secure property rights, or intellectual property laws. Prosperity laws become a coordination problem, seemingly soluble by abstruse mathematics (Romer, 1986).

Review of Related Empirical Literature

A lot of research interest has been shown on the relationship between foreign direct investment and economic growth. The focus of the research work on foreign direct investment and economic growth could be broadly classified into two. First, foreign direct investment (FDI) is considered to have direct impact on trade through which the growth process is assured (Markussen and Vernables, 1998). Second, foreign direct investment (FDI) is assumed to augment domestic capital thereby stimulating the productivity of domestic investments (Borensztein *et al.,* 1998; Driffield, 2001). These two arguments are in conformity with endogenous growth theories (Romer, 1990) and cross country models on industrialization (Chenery *et al*., 1986) in which both the quantity and quality of factors of production as well as the transformation of the production processes were ingredients in developing a competitive advantage.

In the study conducted by (Basu and Guariglia, 2007), a sample of 119 developing countries were used in the study for the period of 1970 – 1999 using the Generalized Methods of Moments (GMM) and the study revealed that foreign direct investments enhanced both educational inequalities and economic growth in developing countries. However, it reduced the share of agricultural sector in gross domestic product.

Johnson (2006) used a sample of 90 developed and developing countries in a study of economic growth and foreign direct investments in the period of 1980 – 2002 using the ordinary least square (OLS) methodology. The study revealed that foreign direct investment inflows accelerated economic growth in developing countries. But it was not valid for developed countries.

Hyun, (2006), used a sample of 59 developing countries in his study for the period of 1984 – 1995. The study used ordinary least square (OLS) methodology to carry out its tests and analysis. The concluded that foreign direct investments had positive effect on economic growth, but lagged foreign direct investments values had no positive effects on current economic growth in these countries for the period studied .

Carkovic and Levine (2002), using panel data from 72 developed and developing countries performed both a cross- section Ordinary Least Square and the Generalised Method of Moments (GMM) analysis, and found that there was no robust link from foreign direct relationship to economic growth.

De Mello (1999), used both time series and panel data from a sample of 32 developed and developing countries and found weak indications of the causal relationship between foreign direct investment and economic growth.

Li and Liu (2005), used 21 developed countries and 63 developing countries to study the impact of foreign direct investments (FDI) on growth, for a sample period of 1970 – 1999. The employed the Unit Root Tests, Durbin – Wu –Hausman Test, and ordinary least squares (OLS) method and was able to ascertain that endogenous relationship between foreign direct investment (FDI) and economic growth has accelerated since the middle of 1980s.

Besides, it was also established that relationship between foreign direct investments, human capital and technological differences affected economic growth in developing countries indirectly. Saha (2005) used 20 Latin America countries and Caribbean countries during the period of 1990 – 2001. The study used 3 Stage Least Squares and found out that foreign direct investments and economic growth were important determinants of each other in Latin America and Caribbean and that there was an endogenous relationship between foreign direct investment and economic growth.

Durham, (2004) conducted a study on growth and foreign direct investment, used 80 countries between the period of 1979 – 1998 using the Extreme Bound Analysis (Sensitivity Analysis) for the study. The study concluded that there was no direct positive effect of current and lagged values of foreign direct investments and portfolio investments on economic growth.

Bengoa and Sanchez –Robles (2003) used 18 Latin America countries for the time period of 1970 to 1999. The Hausman Test and ordinary least squares (OLS) method were used in the study. They found out that economic freedom was an important determinant of foreign direct investments inflows. Also they found that foreign direct investments (FDI) had affected economic growth positively.

Chowdhury and Mavrotas (2006), using data for three countries - Chile, Malaysia and Thailand – found

that gross domestic product caused foreign direct investments (FDI) in Chile and not vice versa while in the case of both Malaysia and Thailand, there was strong evidence of a bi-directional causality between gross domestic product and foreign direct investments.

Varied results had been found on the influence of exchange rate on foreign direct investment inflows. Empirical investigation of firm level data on the US foreign direct investment (FDI) to Korea according to Jeon and Rhee (2008), showed that foreign direct investments inflows had significant association with real exchange rate and expected exchange rate changes. However, Brahmasrene and Jiranyakul (2001), found no statistically significant relationship between the level of exchange rate and foreign direct investment inflows (Ajayi, 2006 and Naudé and Krugell, 2007).

Mateev's (2009) carried out a study of Central and South-eastern European countries foreign direct investment inflows and found that population, distance, gross domestic product, risk, labour costs, and corruption could explain, to a large extent, the size of foreign direct investments flows into transition economies.

Leitão (2010), examined the foreign direct investments attractiveness for Greece as a host country in the period 1998-2007 and found that trade openness, market size and labour costs were significant factors to explain inward foreign direct investments to Greece.

3. Methodology

Model Specification

The econometric model used in this analysis was based on past theoretical and empirical research of Kim and Seo (2003), Lee and Tan (2006), Obwona (2001), in which a country's production or output was represented by the following aggregate production function.

$Y = f(L, K, A)$ ----------Eqn. (2)

Where Y = Output (Gross Domestic Product (GDP), L = Employment, K = Capital stock, A = Total Factor Productivity (TFP) of growth in output, not accounting for increase in factor outputs (K and L). This study employed the endogenous growth model. According to this growth theory, A is endogenously determined by economic factors. In this study, it will not be possible to separate local and foreign components of domestic investment as there are no available data in the literature that have fully captured addition to domestic investment by foreign firms. We assumed that the effect of FDI on economic growth operating through A depends on trade hence a proxy variable for the openness of trade was incorporated into the equation. Thus we have included the ratio of balance of trade to GDP as a proxy for openness of the economy. In view of the fact that a reliable series on capital stock is not available for Nigeria, this study employed the gross national savings to represent K. This proxy variable has been used in numerous previous studies (Athukorala, 2003 and Ayanwale, 2007). This study therefore specifies the model as follows:

$GDP = f((FDI,EXCH,INFLR,GNS,OPN,INTR)$----------Eqn. (3)

$GDP_t = a + FDI_t + EXCH_t + INFLR_t + GNS_t + OPN_t + INTR_t + e$--------Eqn. (4)

Where, GDP is gross domestic product; FDI is foreign direct investment; EXCH is exchange rate; INFLR is inflation rate; GNS is gross national savings; OPN is openness of the economy; INTR is interest rates; a is constant and e is error term

Our *a priori* expectation is that the signs of the parameters (FDI, GNS, OPN) are expected to be positive while the parameters (EXCH, INFLR, INTR) are negative. All the variables are in their log form. The long run equilibrium and the short run dynamics of this model were estimated. Data for this study were gathered mainly from secondary sources which include the Central Bank of Nigeria's Statistical Bulletin (various issues) and National Bureau of Statistics. For this study aggregate time series data was used because of its stationarity characteristics. This implies that the mean and standard deviation do not systematically differ over a period of time. In addition, aggregate data are normally very useful in establishing long term econometric relationship between variables (Hoover, 2014).

4. Data Analysis and Results

Table1 shows the actual yearly values for the dependent and independent variables from 1981 to 2013 period. These variables include gross domestic product, GDP (proxy for economic growth as dependent variable), exchange rate, inflation rate, gross national savings, ratio of balance of trade to gross domestic product (proxy for openness of the economy), lending interest rate and foreign direct investment (as independent variables). It revealed that GDP recorded a low growth rate from 1981 to 1986 ranging from ₦94.3 billion in 1981 to ₦134.6 billion in 1986. This was the period when the Nigerian economy was regulated, and to some extent, was sustained on agricultural output. From 1987 to date, there has been substantial annual increase in GDP with recorded figures of ₦263.3 billion in 1988, ₦1089.77 billion in 1993, ₦14610.9 billion in 2005 and ₦ 42396.8 billion in 2013. The continuous increase in GDP is attributed to the shift from an agrarian economy to an oil dependent economy within the period.

Exchange rate as expected did not change much between 1981and 1986, and also between 1994 and

1998. These were the periods of fixed exchange rate regimes. But from 2000 to date, there have been tremendous changes in the exchange rate of the Naira to the US Dollar and other foreign currencies, for example, the exchange rate of the Naira to the Dollar was ₦ 104.20 in 2000, ₦ 128.65 in 2006 and ₦ 156.31 in 2013 to a dollar. The Naira has therefore continued, to depreciate over time and now in 2015, following the devaluation of the naira, the exchange rate is about ₦ 188.00 to a dollar. The inflation rate has been fluctuating with a recorded low of 4.8 in 1999 and a recorded high of 73.1 in 1995. The gross national savings have also shown continuous but gradual increases in value. This may be attributed to increase in oil revenue within the sample period and general expansion of the economy due to increase in population and economic activities.

The ratio of terms of trade to GDP which is the proxy for openness of the economy was low during the period of regulation of the economy than during the liberalization and deregulation period. 1981 to 1983 and also 1998 had negative signs of -1.8, -1.6, -1.3 and -2.1, respectively. The plausible reason might be that a regulated economy usually has negative effect on its openness and may also have negative impact on foreign direct investment.

The lending interest rate has been high in the Nigerian economy with a recorded low of #7.75 in #1981 to an all time high of #29.80 in 1992. On the average, the lending interest rate has hovered between #25.0 and #16.0 within the sample period. This high level of lending interesting rate has negative implication for foreign direct investment inflows and also general level of output in the economy.

Unit Root Test.

Due to the significance of the unit root in determining the co-integration, the series in the study were tested for unit root using the standard Augmented Dickey-Fuller (ADF) unit root tests. The tests were performed using E-views 8.0 statistical package which automatically selects the number of lagged dependent variables in order to correct for the presence of serial correlation (Asteriou and Hall, 2007). The standard ADF test was conducted for unit roots in the levels (for both constant without trend and constant with trend) and first difference (for both constant without trend and constant with trend), given the automatically selected schwarz information criterion, and the maximum lags, in order to determine the number of unit roots in the series of the variables. The result is presented in Table 2 below.

Table 2: The Results of Augmented Dickey-Fuller (ADF) Test.

	Level		First Difference	
Variables	Constant without Trend	Constant with Trend	Constant without trend	Constant with trend
EXCHR	-1.788997	-2.709999	-7.218885***	-7.326755***
FDI	-0.946105	-4.109675*	-9.511773***	-9.380434***
GDF	-0.769159	-1.132594	-4.369772**	-4.128713**
GNS	0.531126	-2.720398	-3968284**	-3.864172**
INFR	-3.475206*	-4.248288*	-5.912058***	-5.821647***
INTR	-3.285171*	-2.997721	-5.912058***	-5.444882***
RBOT	-3.077769*	-3.789239*	-6.209250***	-6.107552***

Source: Author's Computations, 2015 from e-views results.

Note: Asterisks ***,**,* denote statistical significant at 1%, 5% and 10%, respectively. Lags were automatically selected based on SIC, maximum lag=8.

The result of Augmented Dickey-Fuller (ADF) unit root test presented in Table 2 shows that exchange rate (EXCHR), foreign direct investment (FDI), gross domestic product (GDP), gross national savings (GNS), interest rate (INTR), and ratio of balance of Trade to GDP (RBOT) were not stationary at levels even though INFR, INTR and RBOT showed some level of significance at 10% level of significance. However, the tests showed a consistent results by rejecting the null (HO: a unit root) hypothesis of a unit root at first difference, against the one-sided alternative whenever the ADF statistic is less than the critical value at a statistically significant levels of 1%, 5%, and 10%. Hence, we conclude that the series is stationary at first difference.

Co-integration Test

This involves testing for the existence or otherwise of long-run equilibrium between the series in the model. This study employed the maximum likelihood test procedure suggested by Johansen and Juseluis (1988, 1990). To determine the number of co-integration vectors, Johansen (1988) and Johansen and Juselius (1990) suggested statistical tests. The first one is the trace test (λ trace). It tests the null hypothesis that the number of distinct co-integrating vector is less than or equal to q against a general unrestricted alternatives q= r, this test is shown in the equation below:

$$\lambda\ trace\ (r) = -T \sum_{i=r+1}^{n} In(1-\lambda t) \dots\dots\dots\dots\dots\dots\dots\dots Eqn.(5)$$

Where: T is the number of usable observations, and λt' is the estimated eigenvalue from the matrix. The

second statistical test is the maximum eigenvalue test (λ max) that is calculated according to the following formula:

$$\lambda \max(r, r+1) = -T\ In(1-\lambda r+1) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots Eqn.(6)$$

The test concerns a test of the null hypothesis that there is r co-integrating vector against the alternative of r+1 co-integrating vectors. The test results are presented in Table 3 and 4, respectively.

Table 3: Johansen co- integration test results (trace)

Hypothesized no. of (E(s)	Eigen value	Trace statistic	0.05 critical value	Prob.
None*	0.9956	342.64	125.62	0.0000
At most 1*	0.9560	207.23	95.75	0.0000
At most 2*	0.8767	129.13	69.82	0.0000
At most 3*	0.8281	76.81	47.86	0.0000
At most 4*	0.5372	32.79	29.80	0.0220
At most 5	0.3859	13.53	15.49	0.0969
At most 6	0.0521	1.34	3.84	0.2476

Source: Researchers' Computations 2015 using E-view 8.0 package.
Trace test indicates 4 co-integration eqn(s) at the 0.05 level. * denotes rejection of the hypothesis at the 0.05 level, ** Mackinnon-Haug-Michelis (1999)'s P-values.

Table 4: Johansen co-integration test result (maximum eigenvalue)

Hypothesized no. of (E(s)	Eigen value	Max-eigen Statistic	0.05 critical value	Prob.
None*	0.9956	135.41	46.23	0.0000
At most 1*	0.9560	78.10	40.08	0.0000
At most 2*	0.8767	52.32	33.88	0.0001
At most 3*	0.8281	44.03	27.58	0.0002
At most 4	0.5371	19.26	21.13	0.0896
At most 5	0.3859	12.19	14.27	0.1037
At most 6	0.0521	1.34	33.84	0.2476

Source: Researcher's Computations 2015 using E-views 8.0 package.
Max-eigenvalue test indicates 3 co-integrating equation(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level. ** Mackinnon-Hang-Michelis (1999)' P-values.

The co-integration test results showed that there are co-integrating vectors in the model, with the trace test giving four (4) co-integrating equations and the maximum eigen value test giving three (3) co-integrating equations at 5% level of significance. Once there is co-integrating vector, a long run relationship is concluded on the gross domestic product (GDP) in order to obtain the long-run parameter estimates. This is presented in Table 5 below.

Table 5: Long-run relationship

Variable	Coefficient	Std. Error	T-statistic	P-value
LNGDP(-1)	-0.41508	0.15422	-2.69148	0.5136
LNFDI(-1)	0.84597	0.33280	2.54198	0.0437*
LNEXCHR(-1)	-0.05189	0.55865	-0.09288	0.0268*
LNGNS(-1)	0.38806	0..09203	4.21667	0.0812
LNINFR(-1)	-0.50145	0.45825	-1.09427	0.00444**
LNINTR(-1)	-0.26412	0.05840	-4.52260	0.0426*
LNRBOT(-1)	0.53346	0.57116	0.93347	0.2381

Source: Researcher's Computations 2015 using E-views 8.0 package.
** indicates 1% level of significance, * indicates 5% level of significance.

As shown in Table 5, the long-run gross domestic product was driven by increase or reduction in the level of foreign direct investment. This was revealed by the research finding above (Table 5), that an increase of one percent in foreign direct investment would lead to about 8.46 percent increase in gross domestic product. This is in line with the findings of Imoudu (2012) in which he found that the impact of foreign direct investment on Nigerian economy is small though significant in the long run.

The exchange rate was also significant but carried a negative sign with a coefficient of -0.05189. This is an indication that a unit or 1 percent devaluation/depreciation of exchange rate would lead to 0.5 percent decrease in gross domestic product. Similarly inflation and interest rates negatively impacted on gross domestic product with coefficients of -0.501145 and -0.26412, respectively.

The measure of openness of the economy with a coefficient of 0.53316 was correctly signed but not statistically significant at 5% and 1% levels of significance. Similarly, the gross national savings with a

coefficient of 0.38806 was not significant at 5% and 1% levels of significant but was significant at 10% level. This implied that gross national savings marginally contributed to the output level in the Nigerian economy.

Short Run Error Correction Model

Having confirmed that the residuals from the co-integration are stationary, the dynamic version of the long run model was specified with the residuals from the co integration regression as error correction model (ECM). The result is presented in Table 6 below:

Table 6: Parsimonious Error Correction Model

Variable	Coefficient	Std. Error	T-statistic	P-value
C	0.09859	0.13196	0.74709	0.4652
D(LNGDP(-1))	0.21780	0.29120	0.74795	0.4647
D(LNFDI(-1))	0.17955	0.06443	2.78696	0.0137*
D(LNEXCHR(-1)	-0.14340	-0.06199	-2.31328	0.0335*
D(LNGNS(-1))	0.12315	0.36195	0.34025	0.7378
D(LNINFR(-1))	-0.26991	0.06692	-4.03335	0.008**
D(LNINTR(-1))	-0.33380	0.20166	-1.65530	0.1162
D(LNRBOT(-1))	0.07912	0.08052	0.98262	0.3396
ECM(-1)	-0.207332	0.05630	-368263	0.0019**

Source: Researcher's Computations 2015 using E-views 8.0 package.
** indicates significant at 1%, * indicates significant at 5% level of significance.

Based on the results in Table 6 above, the equation of the ECM is therefore specified in line with the parsimonious model as follows:

$$GDP_t = 0.09859 + 0.21780GDP_{t-1} + 0.17955FDIt - 1 - 0.14340EXCHRt - 1 + 0.12315GNS_{t-1} - 0.26991INFR_{t-1} - 0.33380INTR_{t-1} + 0.07912RBOT_{t-1} - 0.207332ECM_{t-1} - - - - - - - - - Eqn.(7)$$

The equation above shows an ECM value of -0.207332 which is otherwise referred to as the speed of adjustment. The speed of adjustment is statistically significant at 1%, considering its probability value of 0.0019. It is also correctly signed with a negative sign which implies that about 21% of the short run disequilibrium and inconsistencies are being corrected and adjusted into the long-run equilibrium path.

The results stated above are the parsimonious model at lag one and they indicated that in the short run exchange rate, inflation and interest rate negatively impacted on economic growth in Nigeria. On the contrary, foreign direct investment, gross national savings and openness of the economy (RBOT) have positive relationships with real economic growth in Nigeria. Apart from FDI which is significant in explaining real economic growth in Nigeria with elasticity coefficient of 0.17955 which is actually marginal, GNS and RBOT were, however, not significant. This implied that for a 10% increase in the level of foreign direct investment, economic growth will increase by about 1.8 percent. Thus, like the long run, the short run results do not provide much support for the contribution of foreign direct investment to economic growth in Nigeria. This is in line with the results reached earlier by Imoudu (2012) and Akinlo (2004) in Nigeria and Athukorala (2003) in his study in Sri Lanka.

Regression Analysis

The estimated regression results are presented in Table 7 below:

Table: 7 Regression Analysis Estimation Result
(dependent variable: GDP)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-35.190832	4.334244	-8.119248	0.0083
FDI	0.190134	0.039129	4.864916	0.0417
EXCHR	-0.287261	0.034532	-2.135263	0.0357
GNS	0.926537	1.020622	0.907816	0.1417
INFR	-2.135024	0.066631	-3.206206	0.0016
INTR	-0.273113	0.087612	-3.117301	0.0150
RBOT	0.233423	0.233493	0.999718	0.4432

R-squared	0.925283	Mean dependent var	5.684919
Adjusted R-squared	0.924013	S.D. dependent var	2.056177
S.E. of regression	0.161611	Akaike info criterion	-0.188434
Sum squared resid	0.664454	Schwarz criterion	-0.161027
Log likelihood	14.06235	Hannan-Quinn criter.	-0.451484
F-statistic	603.7545	Durbin-Watson stat	1.972192
Prob(F-statistic)	0.000000		

Source: Researcher's Computations, 2015 using E-view 8.0 package

Table 7 showed the regression result of the parameter estimates for testing the impact of foreign direct investment on economic growth in Nigeria. The model of the regression equation used for estimating the effect of foreign direct investment (FDI) on economic growth (GDP) is presented below:

GDP = 35.1908+0.19FDI – 0.29 EXCHR + 0.93 GNS – 2.14 INFR
SE = (0.0391) (0.0345) (1.0206) (0.667)
t = 4.8649 -2.1353 0.9078 -3.2062
- 0.27 INTR + 0.23 RBOT
SE = (0.0876) (0.2335)
t = -3.1173 0.997 ……Eqn. (8)

From the regression equation 8 the calculated t-values 4.8649 (FDI), -2.1353 (EXCHR), -3.2062 (INFR) and -3.1173 (INTR) are greater that the critical value of 1.6951 at 5 percent level of significance in absolute terms. These variables are therefore statistically significant. On the contrary, calculated t-values 0.90781 (GNS) and 0.9997 (RBOT) are less than the critical value of 1.6951 at 5 percent and are therefore not significant. The implication of the above regression equation results is that a 1 percent change in foreign direct investment will lead to a 0.19 percent increase in gross domestic product. This is just a marginal increase. Similarly, a 1 percent increase in exchange rate, inflation rate and interest rate will lead to 0.29, 2.14 and 0.27 percent decrease in gross domestic product, respectively. Also, from Table 7, the coefficient of determination R^2 of 0.925283 (92.53%) showed that the model is a good fit. The critical value of the F- statistic at 0.05 level of significance and with N, d. f. = 6 and D, d. f. = 32 is 2.51 which is less than the F-computed value of 603.75. This implied that the overall model is statistically significant at 5 percent level of significance. An examination of the econometric criterion of the regression analysis revealed that there is no evidence of serial autocorrelation in the residuals of the estimates. This is because the DW statistic value of 1.9722 is near 2.

The value of – 35.1908 is the intercept and represents the value of gross domestic product when all the independent variables are kept constant. The negative sign implied that gross domestic product would decline by about 35.19 percent.

Test of Hypothesis

Hypothesis (HO): Foreign direct investment has no positive and significant effect on economic growth in Nigeria.

Table 8: Effect of foreign direct investment on economic growth in Nigeria

Variable	Coefficient	Std. Error	T. Statistic	Prob.
FDI	0.1901	0.0391	4.8649	0.0417
R^2 = 0.8875	Adj. R =0.7749			
F–statistics=7.8886	DW = 2.0432			

Source: Researcher's Computations using E-views 8.0 package.

The Table 8 results above represent the impact of foreign direct investment on economic growth in

Nigeria. It shows that the coefficient of FDI is 0.1901 while the t – statistics is 4.8649. Comparing the critical value of 1.6951 with the computed t – statistics of 4.8649 shows a significant positive relationship. The hypothesis of no relationship is therefore rejected while the alternative which states that there is a significant positive relationship is accepted. This is in line with Athukorala (2003) in the case of Sri Lanka and Akinlo (2004) in Nigeria. The coefficient of determination (R^2) of 0.8878 (88.78%), showed that the model is a good fit. An examination of the econometric criterion of the model revealed that there was absence of serial autocorrelation in the residuals of the estimates. This is because the Durbin Watson statistic is 2.0432.

5. Conclusion and recommendations

This study estimated the impact of foreign direct investment on economic growth in Nigeria from 1981 to 2013. The study tested the time series data for stationarity by means of the Augmented Dickey Fuller unit root test. Having found that the series was stationary at first difference, the study conducted co-integration test to determine the existence of long run relationship of the variables in the model. This study employed the ordinary least square technique and vector error correction model in its estimations using the E-views 8.0 software. The results of the study revealed that in both the long run and short run, foreign direct investment has positive and significant impact on gross domestic products in Nigeria. Exchange rate of the naira (domestic currency) has negative impact on the growth of the economy in both the long run and short run considerations. Trade openness of the Nigerian economy was not significant in both the long run and short run dynamics.

This study recommends policies that will encourage foreign direct investment in non-oil sector such as agriculture and industrial sectors to boost economic activities and increase output level in Nigeria. It further recommends development policies that are aimed at embarking on greater private (domestic and foreign) participation in the economy. It also recommends the removal of government induced distortions and provision of conducive environment for foreign investors to operate and the creation of friendly business environment in the country by the government to increase the level of openness.

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Appendix

Table 1: Data on dependent and independent variables (1981-2013)

Year	GDP N'Billion	EXCHR	INFLR %	GNS N'Billion	TOPENNESS %	INTR %	FDI N'Billion
1981	94.3	0.6100	21.9	6.56	-1.8	7.75	1725.0
1982	101.0	0.6729	7.4	7.51	-2.6	10.25	1942.6
1983	110.1	0.7241	26	9.44	-1.3	10.00	2183.0
1984	116.3	0.7649	38	10.99	1.6	12.50	2136.3
1985	134.6	0.8938	5	12.52	3.5	9.25	1815.4
1986	134.6	2.0206	6.5	13.93	2.2	10.50	2813.1
1987	193.1	4.0179	9.9	18.68	6.5	17.50	3125.2
1988	263.3	74.5367	58.1	23.25	3.7	16.50	3639.9
1989	382.3	7.3916	51.7	23.80	7.1	26.50	5436.6
1990	328.6	8.0378	5.25	29.65	19.5	25.50	7188.6
1991	545.7	9.905	14.6	37.74	5.9	20.01	9121.6
1992	875.3	17.2984	46.2	55.12	7.1	29.80	1018.5
1993	1089.7	22.0511	58	85.03	4.9	18.32	13416.9
1994	1399.7	21.8861	57.35	110.97	3.1	21.00	13086.0
1995	2907.4	21.8861	73.1	108.49	6.7	20.18	30777.0
1996	4032.3	21.8861	27.18	134.50	18.5	19.74	36346.6
1997	4189.2	21.8861	10.5	177.65	9.5	13.54	35237.8
1998	3989.5	21.8861	8.1	200.07	-2.1	18.29	39156.2
1999	4679.2	92.6934	4.8	277.67	7.0	21.32	41455.5
2000	6713.6	104.1952	8.6	385.19	14.3	17.98	50253.9
2001	6895.2	111.943	17.5	488.05	7.4	18.29	44876.5
2002	7795.8	120.9702	12.9	592.09	3.0	24.85	56377.0
2003	9913.5	129.3565	15.5	655.74	10.2	20.71	65151.0
2004	11411.1	133.5004	14.0	797.52	22.9	19.18	77648.5
2005	14610.9	132.1470	17.7	1,316.96	30.4	17.95	101133.2
2006	18564.6	128.6516	8.9	1,739.64	22.7	17.26	103143.3
2007	20657.3	125.8331	5.6	2,693.55	21.3	16.94	105353.2
2008	24296.3	118.5669	11.58	4,118.17	20.1	15.14	108365.2
2009	24794.2	148.9017	12.0	5,763.51	13.3	18.99	118252.7
2010	33,984.8	150.2980	13.72	5,954.26	12.0	17.59	136828.0
2011	37,409.9	153.8616	10.8	6,531.91	12.3	16.02	139268.4
2012	40544.1	157.50	12.24	8,062.90	14.0	16.79	145543.8
2013	42396.8	157.31	11.0	8,656.12	14.2	16.72	148365.3

Source: Researcher's Computations from *Central Bank of Nigeria statistical bulletin 2013*